

Mapping of and policy
orientation for the mitigation of
climate change impacts on
agriculture and rural development
in selected countries of the CEE
and CA regions

FAO project

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Content

- Climatological background
- Adaptation and potential adaptation measures
- FAO activity
- Actual project

Adaptation

Adaptation in natural and human systems in response to actual or expected climatic stimuli or their effects, which moderates harm or exploits beneficial opportunities. Various types of adaptation can be distinguished, including anticipatory or reactive adaptation, private and public adaptation, and autonomous and planned adaptation.

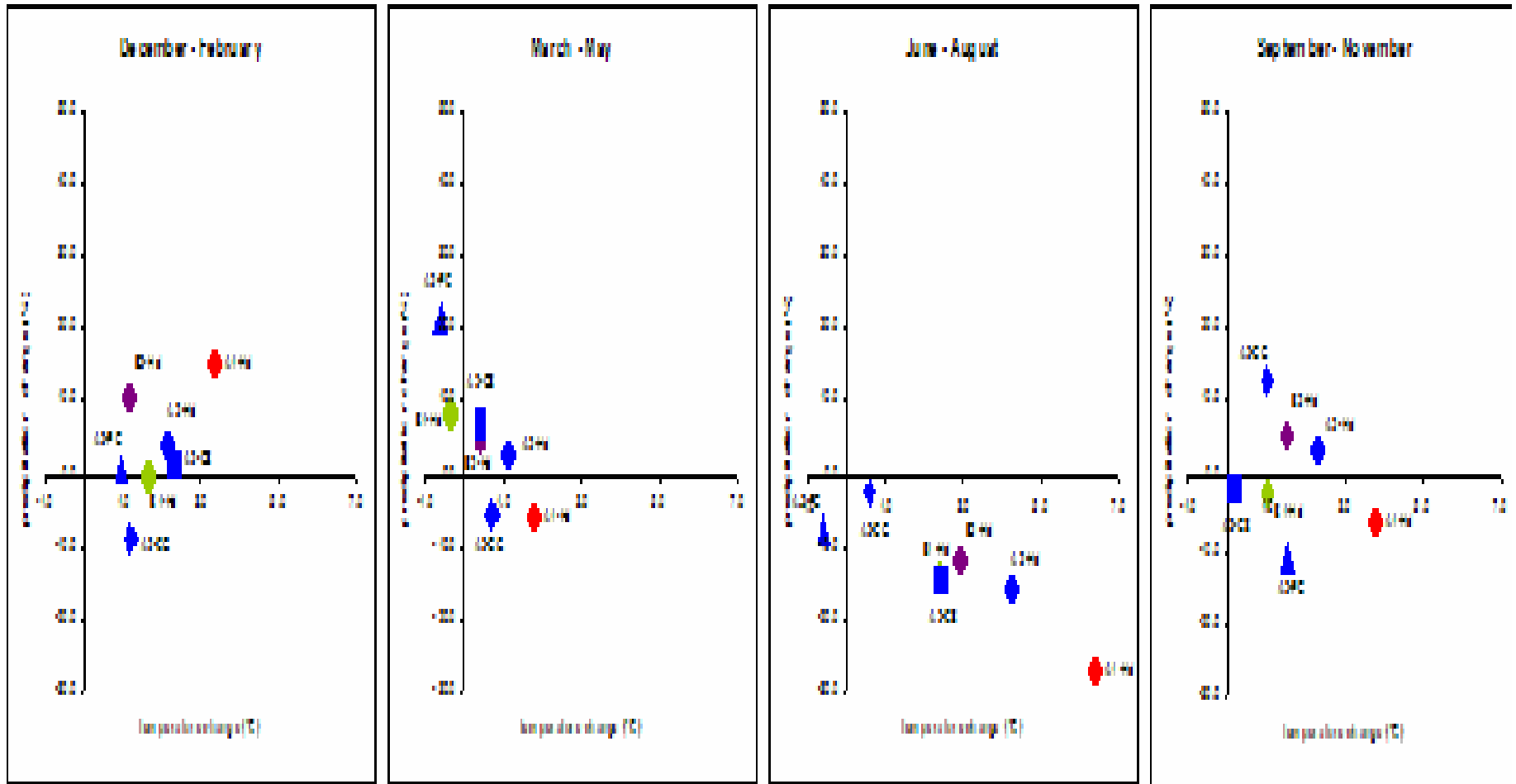
Mitigation vs. adaptation

	Mitigation	Adaptation
Benefited systems	All systems	Selected systems
Scale effect	Global	Local to regional
Life time	Centuries	Years to centuries
Lead time	Decades	Immediate to decades
Effectiveness	Certain	Generally less certain
Ancillary benefits	Sometimes	Mostly
Polluter pays	Typically yes	Not necessarily
Payer benefits	Only little	Almost fully
Monitoring	Relatively easy	More difficult

Southeast-Europe, 2080 vs. 1961-1990

*Albania, Bosnia-Herzegovina, Croatia,
FYR Macedonia, Serbia and Montenegro*

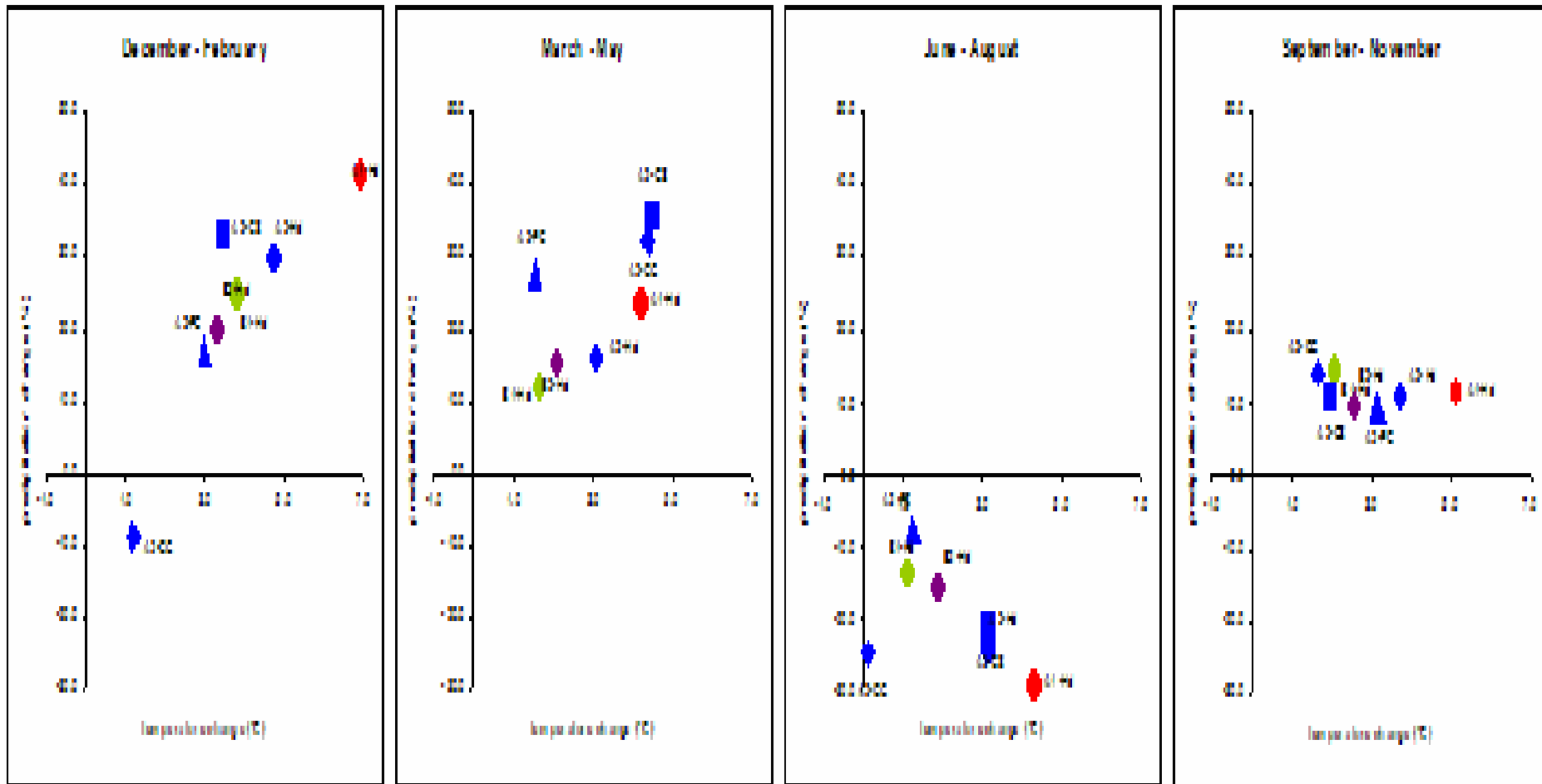
Metzger et al., 2008



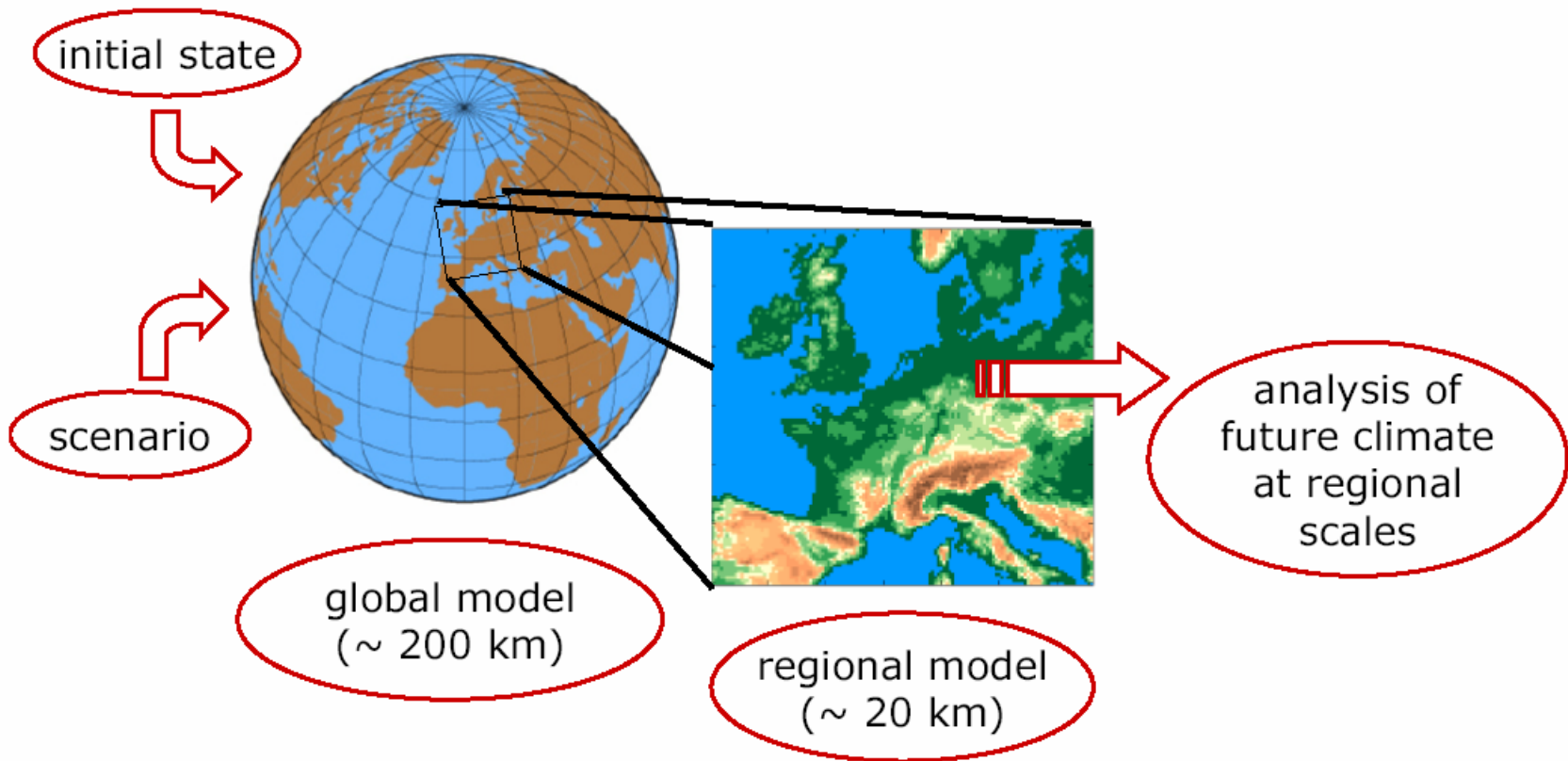
Eastern-Europe, 2080 vs. 1961-1990

Russia, Belarus, Ukraine, Moldova, Georgia, and Armenia

Metzger et al., 2008

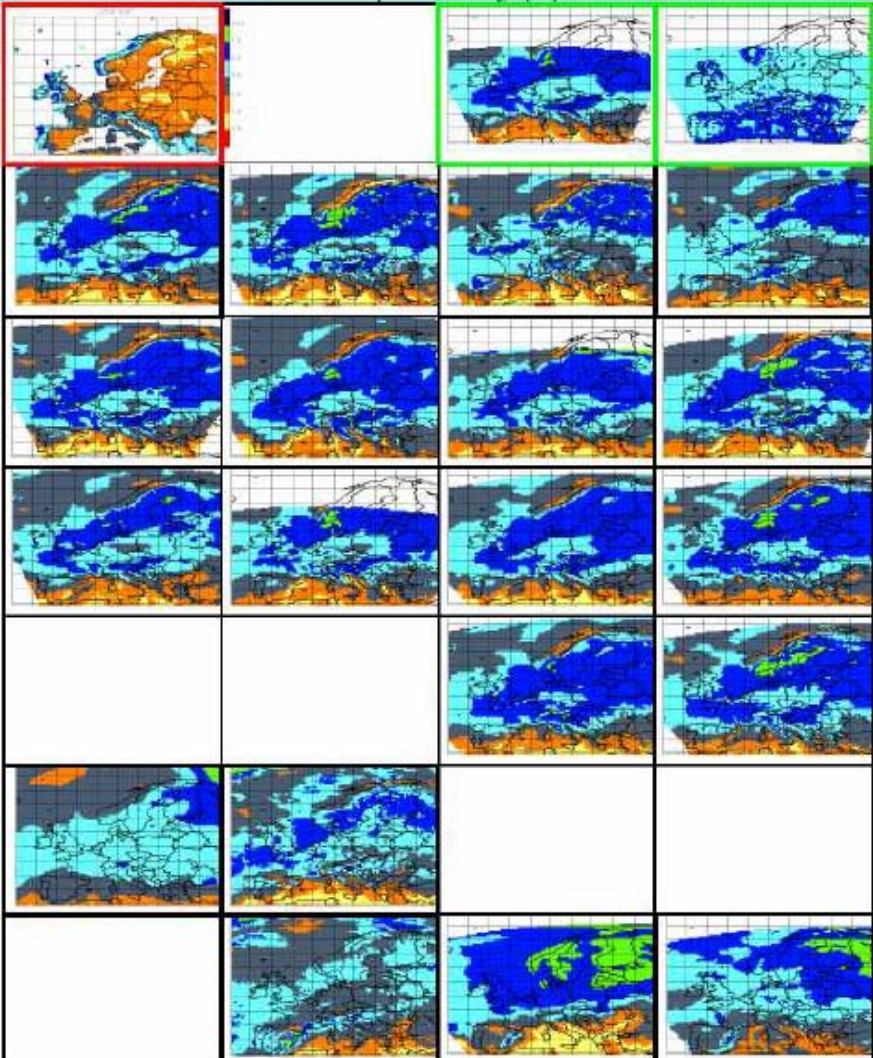


Uncertainties of climate modeling

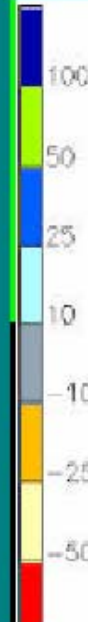
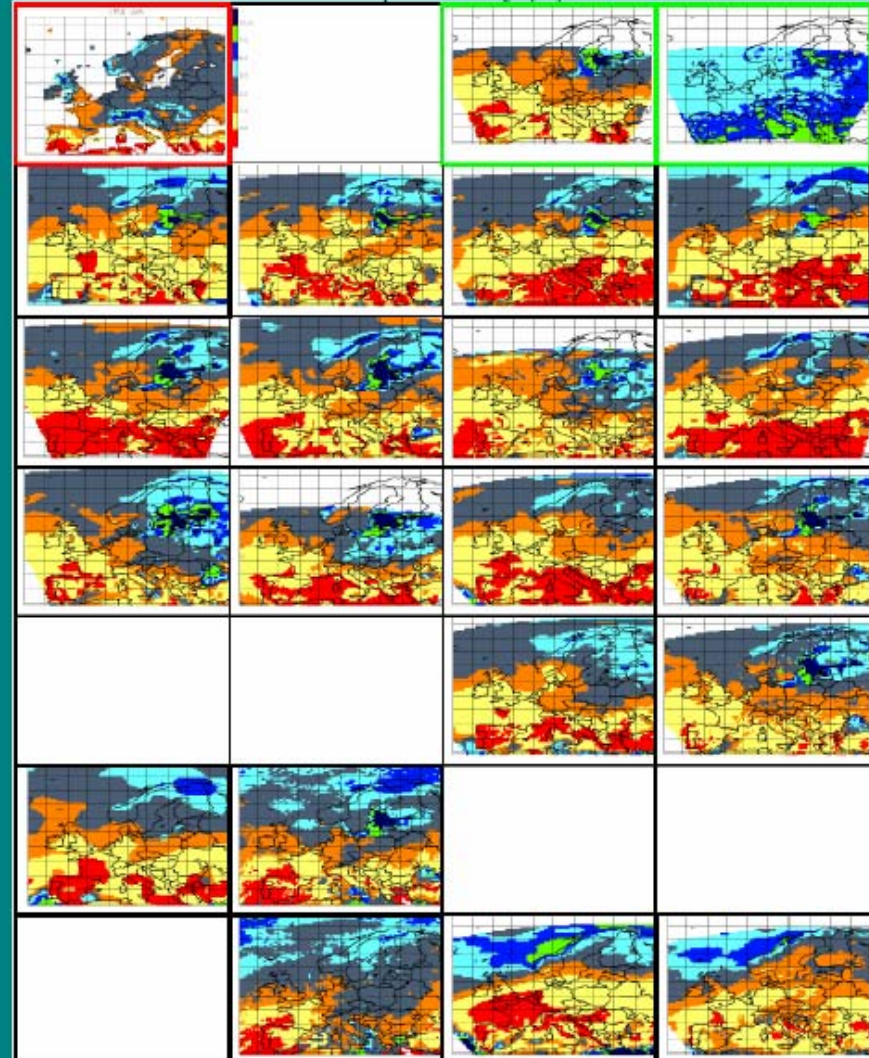


Expected precipitation changes for 2071-2100 A2 scenario, PRUDENCE (19 model runs)

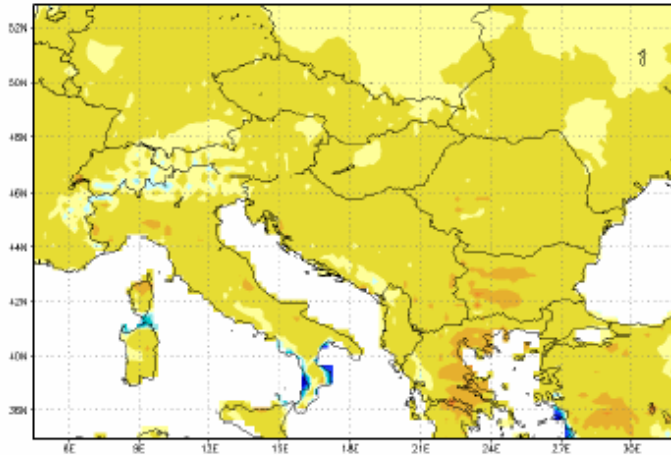
WINTER (DJF)



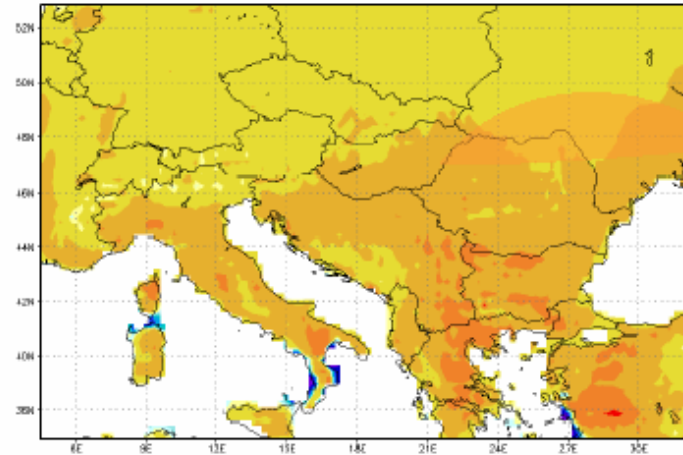
SUMMER (JJA)



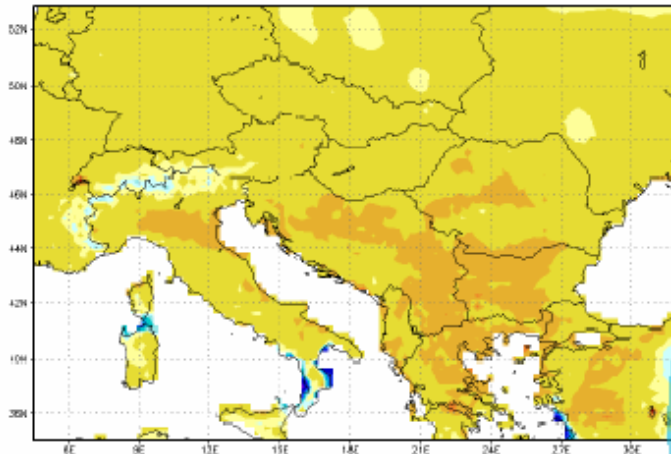
Difference of seasonal mean temperature (REMO - CRU) [°C]
Period: MAM, 1961-2000; model resolution: 0.22 deg.



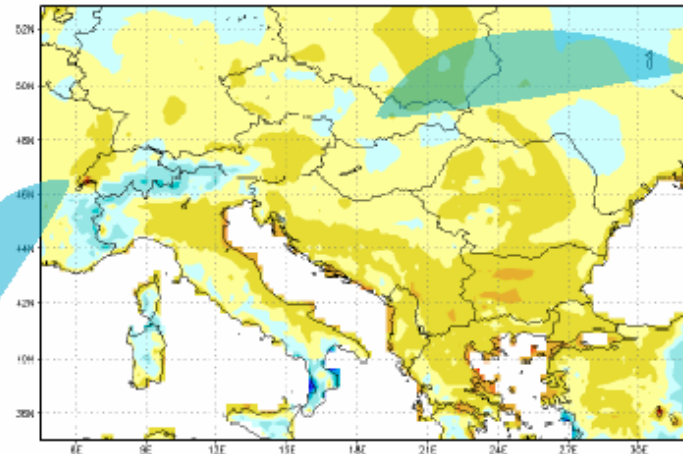
Difference of seasonal mean temperature (REMO - CRU) [°C]
Period: JJA, 1961-2000; model resolution: 0.22 deg.



Difference of seasonal mean temperature (REMO - CRU) [°C]
Period: SON, 1961-2000; model resolution: 0.22 deg.



Difference of seasonal mean temperature (REMO - CRU) [°C]
Period: DJF, 1961-2000; model resolution: 0.22 deg.



1-5 °C

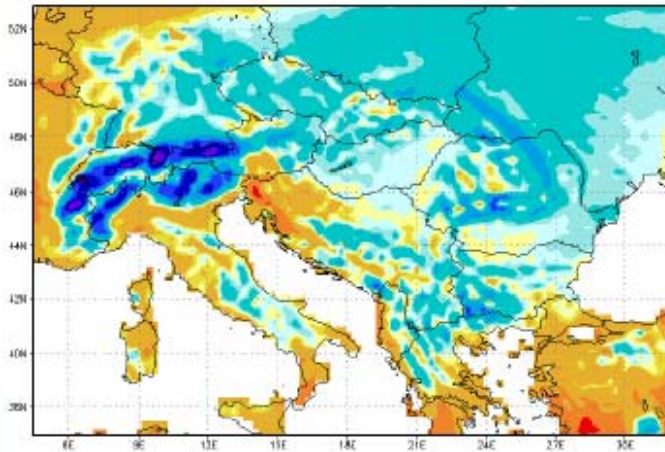
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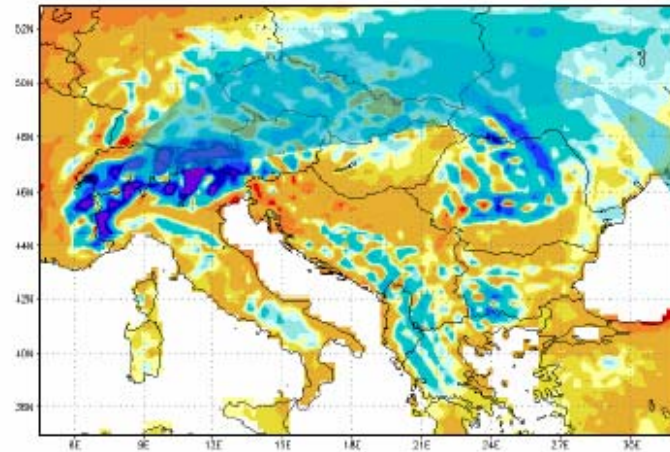
0-3 °C

Seasonal differences Szépszó, 2007)

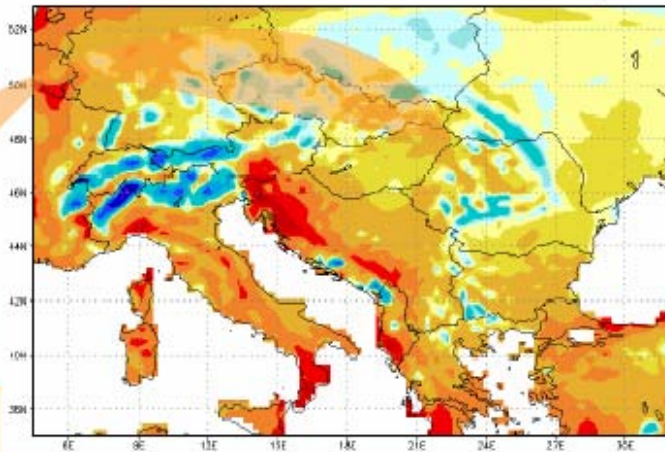
Seasonal difference of precipitation (REMO - CRU) [mm/month]
Period: MAM, 1961-2000; model resolution: 0.22 deg.



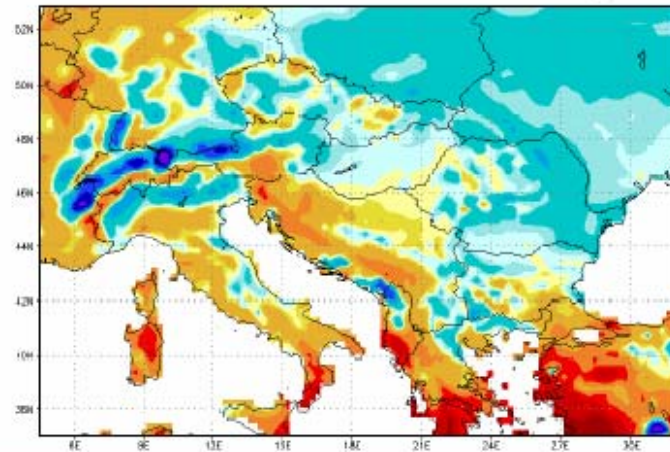
Seasonal difference of precipitation (REMO - CRU) [mm/month]
Period: JJA, 1961-2000; model resolution: 0.22 deg.



Seasonal difference of precipitation (REMO - CRU) [mm/month]
Period: SON, 1961-2000; model resolution: 0.22 deg.

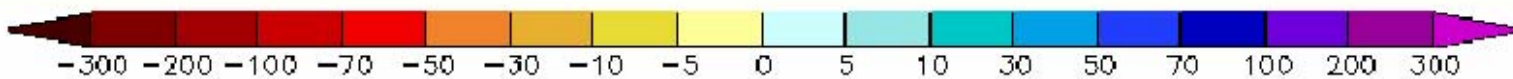


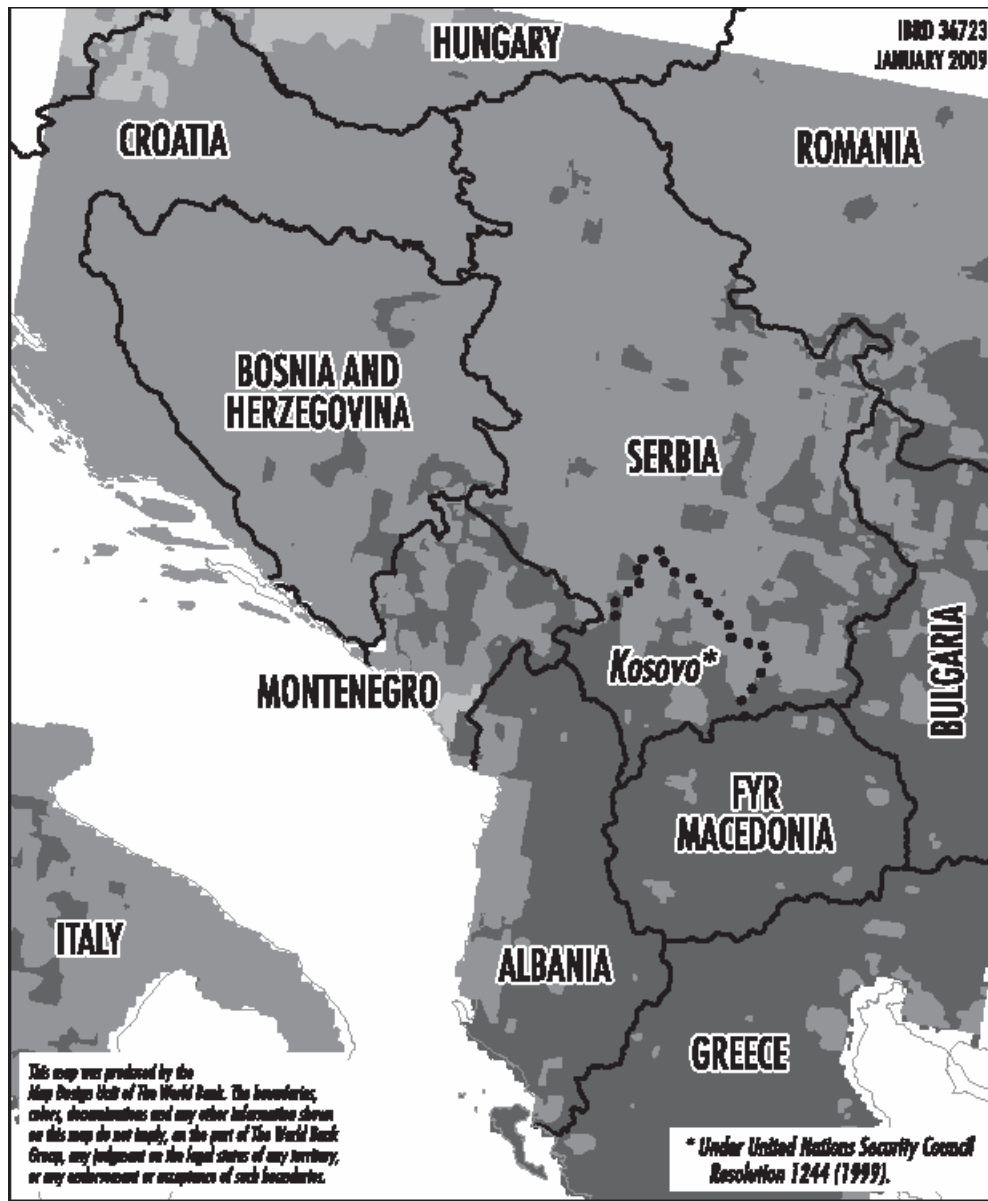
Seasonal difference of precipitation (REMO - CRU) [mm/month]
Period: DJF, 1961-2000; model resolution: 0.22 deg.



1-200 mm

0 mm

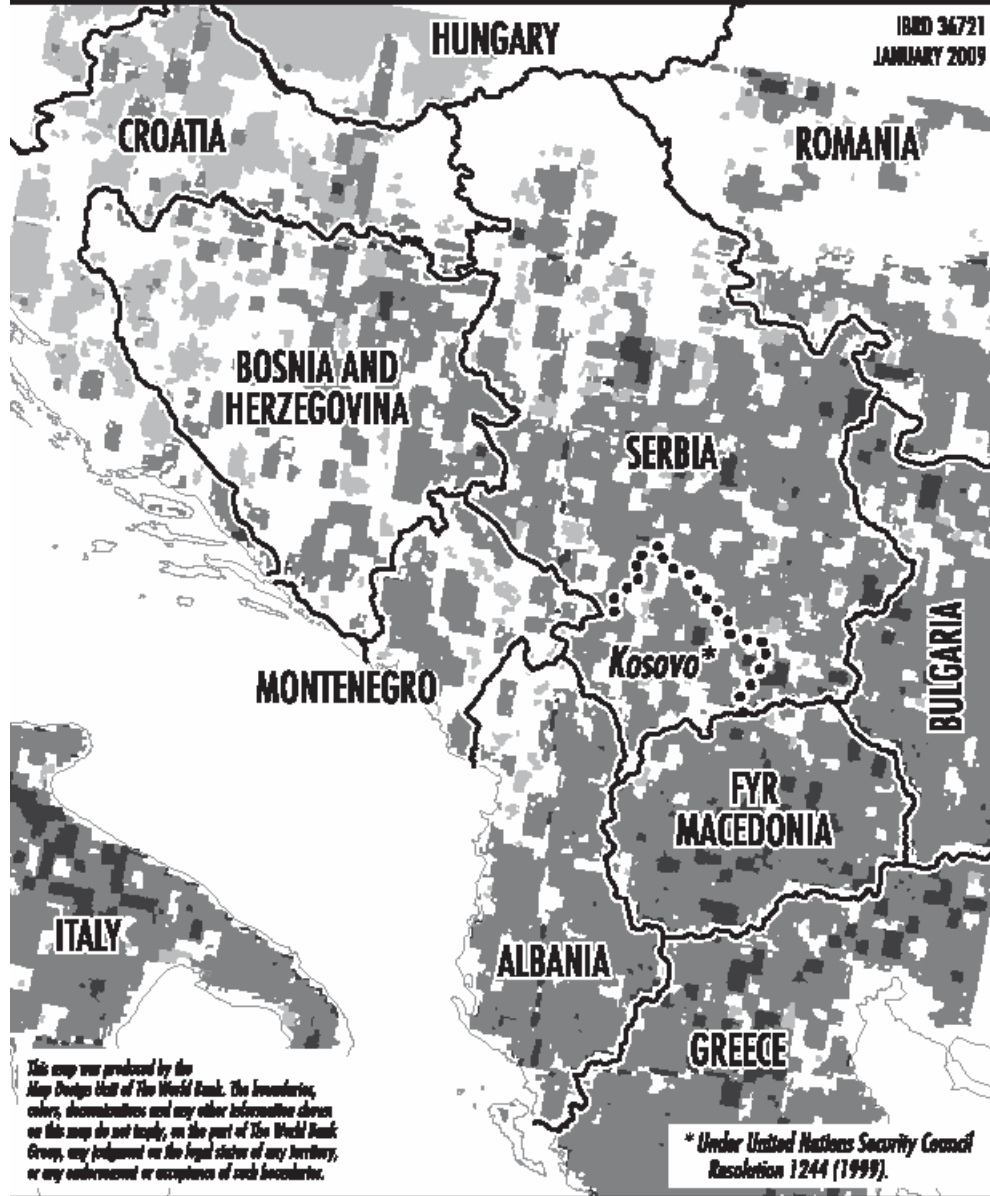




Change in Mean Annual Temperature between 1961–90 and 2071–2100
EU, 2007

TEMPERATURE: CHANGE IN MEAN ANNUAL TEMPERATURE (C°)





Change in Mean Annual Precipitation between 1961–90 and 2071–2100
EU, 2007



Requirements

- Adaptation to projected climate changes, however, requires tools and mechanisms, many of which are still to be developed, to meet engineering standards with respect to the accuracy and quality of projections. Uncertainties are still large, meaning that water managers have to include this element in their decision making process.

Mr. M. Jarraud, Secretary-General of WMO, Helsinki, Finland, Conference on Climate and Water, 3-6 September 2007

Impact of CC on agricultural soils

- Effects of higher carbon dioxide on soil properties and productivity
- Soil dynamics and the implications for agriculture
 - Soil water
 - Soil workability
 - Soil degradation (acidification, salt affected soils, erosion)
 - Soil organic matters
 - Soil ecology
 - Soil temperature
 - soil structure
 - soil nutrient status
 - mineral transformations and clay surface processes

Soil responses to climate (1) (Rounsevell et al., 1999)

	Time scale of response	Soil processes	Climate influence	Reversible	Other influences
Soil water content	Daily	Infiltr., percol., drainage, runoff	P, T, ET, CO ₂	Y	SOM, structure
Soil workability	Daily, weekly	Infiltr., drainage, runoff, aggreg., tillage	P, T, ET, CO ₂	Y	Water content, SOM, structure
Soil temperature	daily	Heat conductivity	P, T, ET, CO ₂	Y	Water content, SOM
Soil structure	Monthly	Freeze-thaw, shrink-swell, aggr.	P, T, ET, CO ₂	Y	Part. size distr. Wat. Cont., SOM
Degradation	Daily/annually	Salin. alkalin., erosion, acidif.	P, T, ET, CO ₂	Y	distr., Wat. Cont., SOM
Organic carbon cont.	Annual/century	Respiration, biomass returns	P, T, ET, CO ₂	Y	Water content

Soil responses to climate(2) (Rounsevell et al., 1999)

	Time scale of response	Soil processes	Climate influence	Rever sible	Other influences
Nitrogen content	Monthly/annual	Respiration, biomass returns	P, T, ET, CO ₂	Y	Water content, SOM
Ecological composition	Annual	Mineral., nitrif/denitrif., leaching, volatility	P, T	Y	Water content, SOM
Nutrient status (macr/micr)	weekly	Mineral., weathering	P, T, ET, CO ₂	Y	Water content, SOM
Particle size distr.	Decade/ Century	Clay transloc., weathering	P, T	No	Water content
Mineralogy (clays, Fe, Al)	Century/ millenn.	Pedogenesis, weathering	P, T	No	Water content

Adaptation to cc (1) (WMO, 2004)

- Field scale:
 - Changing mashinery
 - Timing of operations
 - Use of different crops
 - Irrigation

Adaptation to cc (2) (WMO, 2004)

- Farm scale:
 - Farm size
 - Diversification to non-agricultural land uses via changes in profitability
- Regional and/or national size:
 - Policy response
 - Market support
 - Environmental regulation

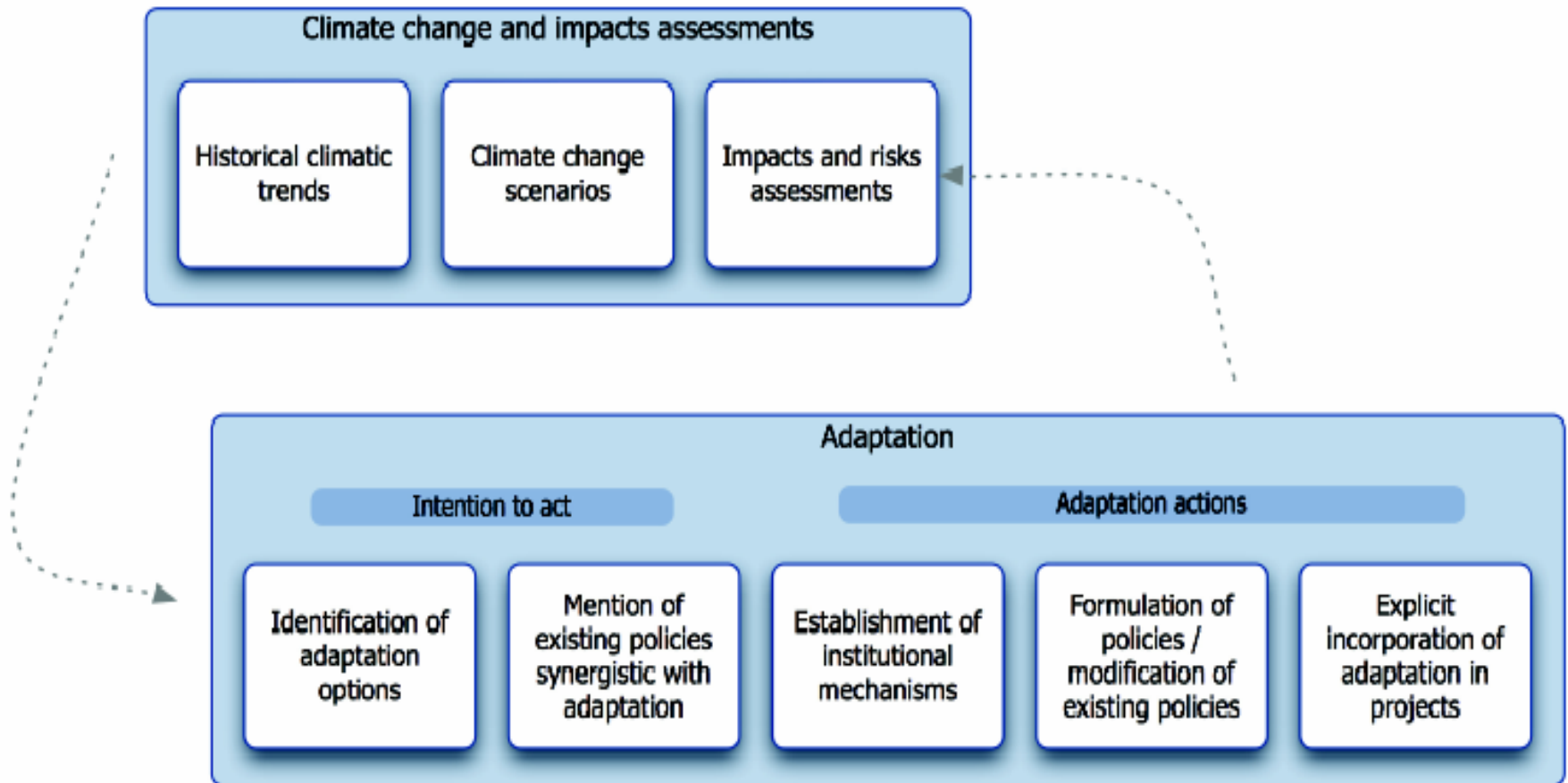
List of FAO's adaptation interventions (1)

- Demand driven and location specific interventions on climate change adaptation
- Building on existing strengths focusing on food security
- Strengthening institutional and technical capacities
- Cc adaptation as an ongoing social learning process
- Cc adaptation interventions at different scales and linking activities
- Inclusion of local perceptions and participatory approaches for prioritizing adaptation practices
- Beyond climate variability targeting future cc risks and opportunities

List of FAO's adaptation interventions (2)

- Moving beyond data to decision support to provide opportunities for proactive decision making
- Ecosystem integrity and natural resource management in cc adaptation
- A multidisciplinary approach – toward a corporate FAO response
- Integration of cc adaptation, disaster management and development
- Mainstreaming climate change concerns into development planning
- Learning from the field experience and feedback, advice to policy

Adaptation process



Mapping of and policy orientation for
the mitigation of climate change
impacts on agriculture and rural
development in selected countries of
the CEE and CA regions

FAO project

Background

- FAO was encouraged by the 26th European Regional Conference (ERC) to allocate resources to the elaboration of comprehensive analyses of climate change and impacts, policy scenarios and outlook studies with a regional focus
- FAO was urged to organize a series of expert level workshops and high-level meetings on cc impacts and adaptation measures in the regions.

Countries stressed their interest

Albania, Armenia, Azerbaijan, Belarus,
Georgia, Hungary, Kazakhstan, Kyrgyzstan,
Moldova, Romania, Slovakia, Tajikistan,
Ukraine and Uzbekistan

Status

- The project is approved
- It is a short time TCP project till spring 2010

Objectives (1)

- A comprehensive inventory of available studies, adaptation measures and policies related to the reduction of impacts of climate change in the field of agriculture, forestry and water management in participating countries of the CEE and CA sub-regions.
- Review of known impact projections, national policy scenarios and outlook studies and their regional implications with focus on adaptation and mitigation measures in agriculture.

Objectives (2)

- Recommendations on best practices for adaptation and policy measures at national and regional level (including international cooperation at trans-boundary and sub-regional level).
- Proposals for future technical assistance to the member countries for future research and adaptation responses both at national as well as at regional level.

Expected outputs (1)

- An agreed common methodology on the mapping of available documentation on research, analyses and case studies on climate change and the review of policy scenarios and outlook studies with regional focus
- Inventory of present status of climate change related research and adaptation activities, in depth review and analyses of impacts of current climate variability and change projections on crop production conditions and yields
- Homepage

Expected outputs (2)

- Dissemination of good farming practices for adaptation to climate variability and change by the member countries of the Region.
- Proposals for further studies and works on specific impact projections and adaptation measures to alleviate climate change impacts reinforcing national implementation of FAO's normative recommendations.

Events

- Preparatory sub-regional technical seminar (on common methodology, some studies made already), Budapest, by the beginning of October
- 4 country group seminars to map the ongoing research
- High level forum to address sub-regional issues, Budapest, by the beginning of February

Papers

- Preliminary papers are already available for:
 - Armenia
 - Georgia
 - Moldova
 - Ukraine

Future

- The best possible future could be a larger project for part of the participating countries on the learning of best practice

Moldova

- Programmes
 - National Development Strategy for 2008-2011
 - National Strategy for Republic of Moldova Agro-Industrial complex sustainable development (2008-2015)
 - National Program on modernization and technical adaptation of the food processing industry capacities
 - National Program on the use of renewable energy resources in agriculture
 - National Program on energy conservation for 2003-2010

Georgia

- Programmes
 - National Program on Climate Change
- Projects
 - Assistance to Georgia in meeting the commitments to the UN Framework Convention on Climate Change
 - National Capacity Needs Self-Assessment (NCSA) for Global Environmental Management
 - Climate Tolerant Rehabilitation of Degraded Landscapes, Georgia
 - Mitigating Impacts of Climate Change through the Restoration of Forest Landscapes in the Southern Caucasus

Armenia

- Strategies, plans
 - Agricultural Sustainable Development Strategy of the Republic of Armenia, 2006
 - Strategy on National Security 2007
 - Food Security Policy 2005
 - National Forest Policy and Strategy (2004) and Forest National Programme 2005
 - National Action Plan to Combat Desertification in Armenia 2002
 - State Strategy and National Action Plan for Development of Nature Protected Areas in Armenia 2002
 - Sustainable Development Programme 2008

Thank you for your attention!